

Video switch for CANAL-Plus decoder

BA7631 / BA7631F

The BA7631 and BA7631F are audio-switching ICs for decoders for scrambled pay channels used in France and other countries. The ICs include a five-input multiplexer, a four-input multiplexer and a two-input multiplexer, and allow decoder audio switching to be done with a single IC. When used in combination with the BA7630S common logic control can be used for audio and video switching.

● Applications

Video cassette recorders

● Features

- 1) All the audio-switching functions required for SECAM CANAL -plus decoder integrated onto one chip.
- 2) Inputs terminated with $65\text{k}\Omega$ resistors.
- 3) Built-in output buffer.
- 4) Wide supply voltage range (4.5V to 13.0V).
- 5) Low total harmonic distortion (0.005% Typ.).
- 6) Wide dynamic range (3.6Vrms, $V_{cc} = 12\text{V}$).
- 7) Same control logic as for the BA7630S can be used.

● Absolute maximum ratings

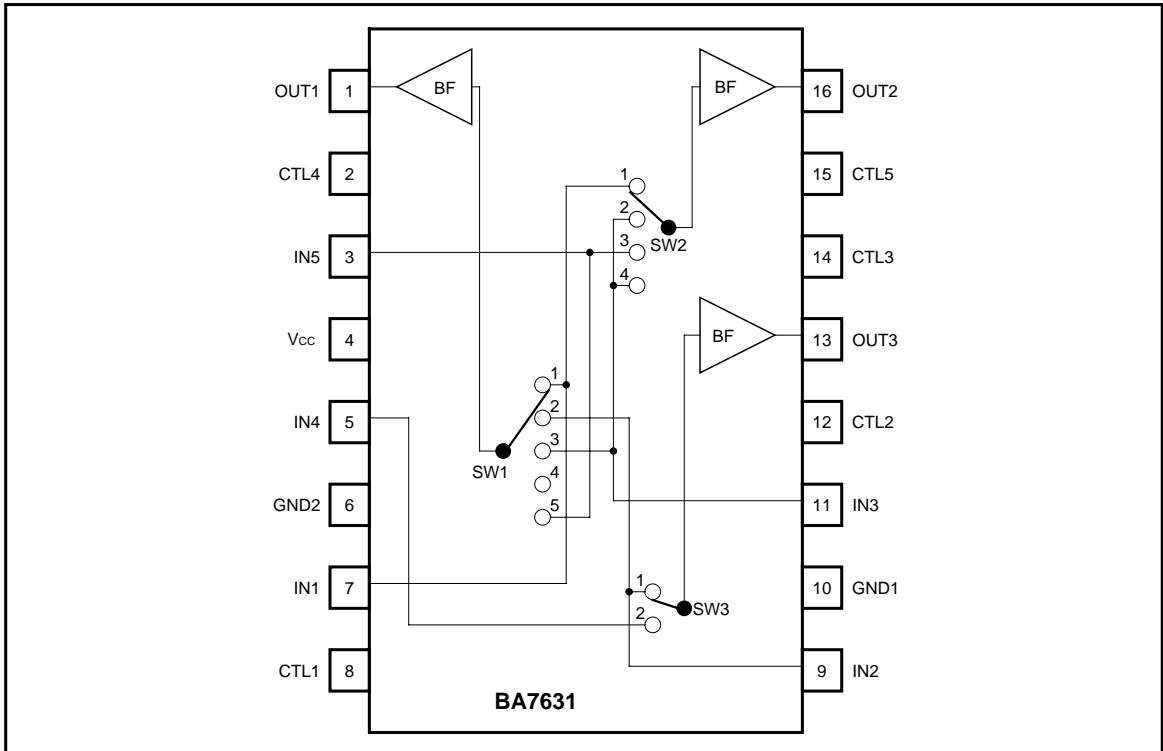
Parameter	Symbol	Limits	Unit
Applied voltage	V_{cc}	13.5	V
Power dissipation	P_d	1100* (DIP) 500* (SOP)	mV
Operating temperature	T_{opr}	− 25 ~ + 70	°C
Storage temperature	T_{stg}	− 55 ~ + 125	°C

* Reduced by 11mW (DIP) or 5mW (SOP) for each increase in T_a of 1°C over 25°C.

● Recommended operating conditions ($T_a = 25\text{°C}$)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{cc}	4.5 ~ 13.0	V

● Block diagram



● Truth table

OUT1 SW1 block

CTL1	CTL2	CTL5	SELECT
L	L	L	IN1
L	H	L	IN2
H	L	L	IN3
H	H	L	MUTE
*	*	H	IN5

* Don't care

OUT2 SW2 block

CTL3	CTL5	SELECT
L	L	IN1
H	L	IN3
L	H	IN5
H	H	IN3

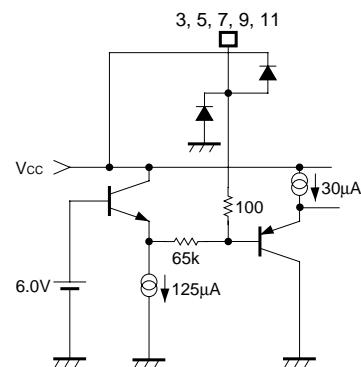
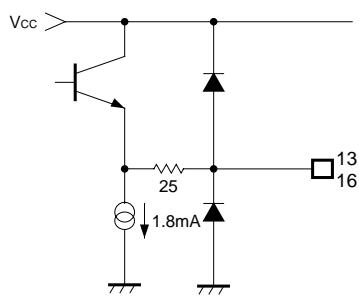
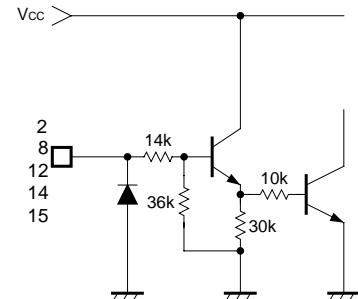
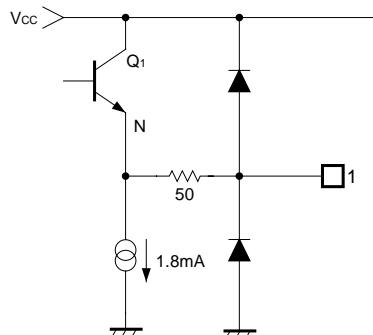
OUT3 SW3 block

CTL4	SELECT
L	IN2
H	IN4

● Pin descriptions

Pin No.	Pin name	Function
1	OUT1	Output 1
2	CTL4	Control 4
3	IN5	Input 5
4	Vcc	Power supply
5	IN4	Input 4
6	GND2	GND (GND1 common)
7	IN1	Input 1
8	CTL1	Control 1
9	IN2	Input 2
10	GND1	GND (GND2 common)
11	IN3	Input 3
12	CTL2	Control 2
13	OUT3	Output 3
14	CTL3	Control 3
15	CTL5	Control 5
16	OUT2	Output 2

● Input / output circuits



● Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$ and $V_{CC} = 12\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Recommended operating voltage	V_{CC}	4.5	12.0	13.0	V	—
Circuit current	I_{CC}	—	14.9	24.0	mA	—
Maximum output level	V_{OM}	3.1	3.6	—	V_{rms}	$f = 1\text{MHz}$, THD = 0.5%
Voltage gain	G_V	-0.5	0	0.5	dB	$f = 1\text{kHz}$, $V_{IN} = 3.0\text{dBm}$
Total harmonic distortion	THD	—	0.005	0.1	%	$f = 1\text{kHz}$, $V_{IN} = 3.0\text{dBm}$
Interchannel crosstalk	C_{TM}	—	-75	-60	dB	$f = 10\text{kHz}$, $V_{IN} = 3.0\text{dBm}$
Input conversion noise voltage	$V_{MIN.}$	—	20.0	40.0	μV_{rms}	30kHz LPF, $R_g = 2.2\text{k}\Omega$
CTL switch level	V_{TH}	1.0	2.0	3.0	V	—
Input impedance	Z_{IN}	48.5	65	80.5	$\text{k}\Omega$	—

○Not designed for radiation resistance.

● Circuit operation

The BA7631 and BA7631F make it easy to construct a decoder for the scrambled pay channels. They have been designed specifically for audio signal decoding. As shown in the application examples in Figs. 1 and 2, there are inputs for TV, VCR, decoder, and AUX, to cover a wide range of applications. When the AUX input is not used, by setting CTL5 to "L", the system construction becomes the same as that of the BA7630S, and the BA7630S switching logic can be used as is.

● Application example

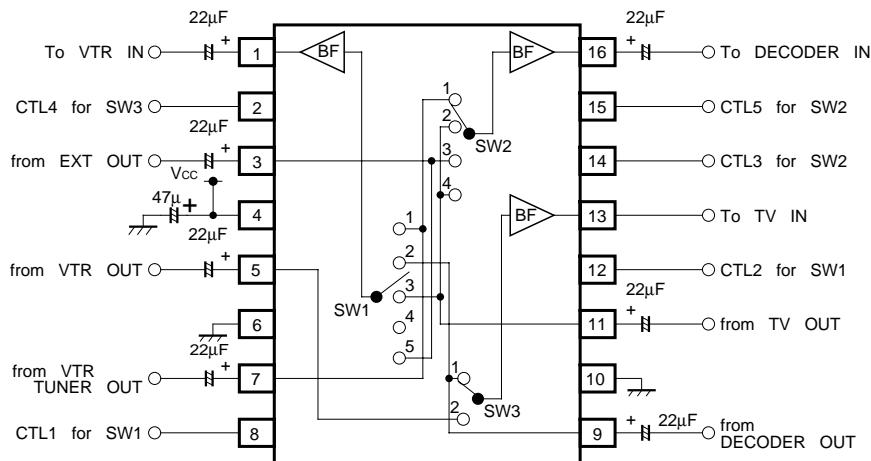


Fig.1

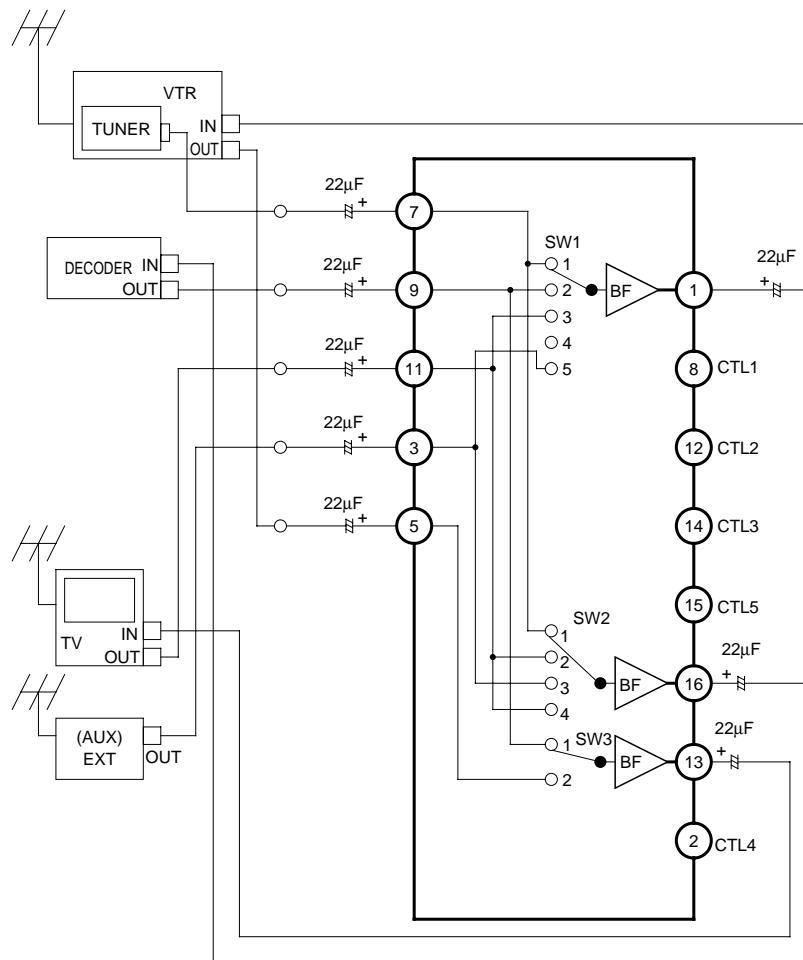


Fig.2

● Electrical characteristic curves

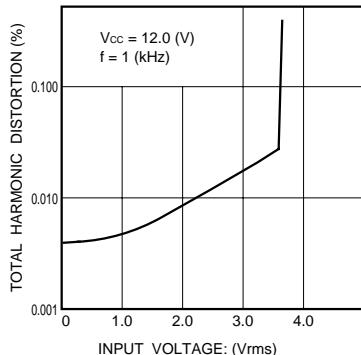


Fig. 3 Distortion characteristics

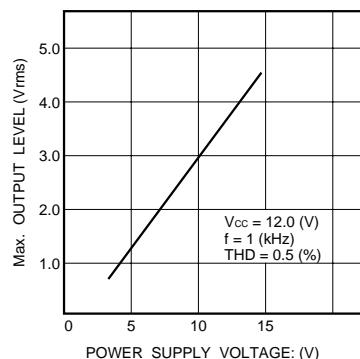
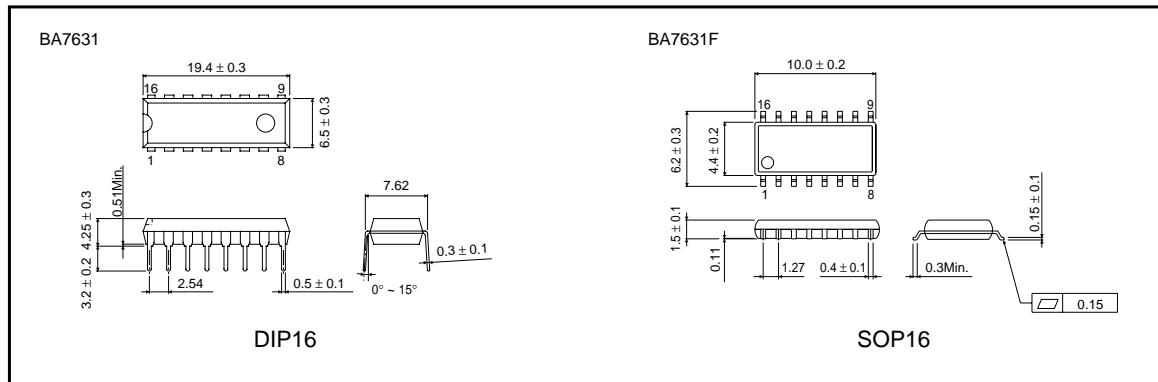


Fig. 4 Power supply voltage vs. dynamic range characteristics

● External dimensions (Units: mm)



Appendix

Notes

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